

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Takashi ASAHINA et al.

Serial No : Not Yet Assigned

Filed : Concurrently Herewith

For : PRISMATIC BATTERY MODULE AND METHOD
FOR MANUFACTURING THE SAME

PRELIMINARY AMENDMENT

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Prior to calculation of the filing fees and the examination of the above-identified patent application on the merits, the Examiner is respectfully requested to amend the specification and claims as follows:

IN THE SPECIFICATION

Please amend the specification as follows (a marked-up copy of the specification amendments is provided as an attachment to this Amendment):

Paragraph beginning at page 1, line 18 (Clean Copy):

A conventional rechargeable battery module made by connecting a plurality of cells together, each having an individual cell case, has a problem that the connection path between the cells is long and the number of connection points is large and each of the connection points has small cross-sectional area , thereby increasing the component resistance leading to the increase of internal resistance thereof.

Paragraph beginning on page 8, line 13 (Clean Copy):

A prismatic battery module according to a fourth aspect of the invention includes a prismatic battery case constructed by connecting a plurality of prismatic cell cases together in series, each pair of cell cases sharing a separation wall; an electrode plate group formed by alternately stacking positive and negative electrode plates interposing a separator therebetween and further forming lead portions by projecting one side portion of the positive electrode plates and one side portion of the negative electrode plates in opposite directions, respectively; a plurality of connecting rods formed so as to penetrate the lead portions on both sides of the electrode plate group, respectively; and an electroconductive plate provided in at least one sidewall of the prismatic battery case and facing adjacent cell cases, in which each of the plurality of connecting rods and the electroconductive plate are connected to each other. As at least one of both end portions of the plurality of connecting rods penetrating the lead portions of the electrode plate group connects the lead portions of adjacent electrode plate groups to each other via the electroconductive plate, the electrical communication path between the electrode plate groups becomes shorter allowing the reduction of the internal resistance of cell and further, the upper portion of the collector is not required to project upwardly from the electrode plate group, resulting in the volume reduction of prismatic battery case.

IN THE CLAIMS

Please amend claims 4 , 10, and 11 as follows (a marked-up copy of the claim amendments is provided as an attachment to this Amendment):

4. (Amended-Clean Text) The prismatic battery module according to claim 1, wherein the adjacent collectors are connected to each other by using an electroconductive adhesive coated on opposing portions of said adjacent collectors, said opposing portions facing each other.

10. (Amended-Clean Copy) A prismatic battery module comprising:
a prismatic battery case constructed by connecting a plurality of prismatic cell cases together in series, said plurality of cell cases being separated from one another by separation walls respectively;
an electrode plate group formed by alternately stacking positive and negative electrode plates interposing a separator therebetween and further forming lead portions by projecting one side portion of said positive electrode plates and one side portion of said negative electrode plates in opposite directions, respectively;
a plurality of connecting rods formed so as to penetrate said lead portions on both sides of said electrode plate group, respectively; and
an electroconductive plate provided in at least one sidewall of said prismatic battery case and facing adjacent cell cases,

each of said plurality of connecting rods and said electroconductive plate being connected to each other.

11. (Amended-Clean Text) The prismatic battery module according to claim 9, wherein electroconductive plates are provided in both sidewalls of said prismatic battery case, and working openings are formed in said both sidewalls of said prismatic battery case so as to expose said electroconductive plates, and said electroconductive plates and selected one from said collectors and said plurality of connecting rods are bonded together by using one bonding method selected from resistance welding and soldering, said one bonding method being performed by supplying welding current between both of said electroconductive plates in a state of said electroconductive plates and said selected one from said collectors and said plurality of connecting rods being in contact with each other.

Please add new claims 19 and 20 as follows:

---19. The prismatic battery module according to claim 2, wherein the adjacent collectors are connected to each other by using an electroconductive adhesive coated on opposing portions of said adjacent collectors, said opposing portions facing each other.

20. The prismatic battery module according to claim 10, wherein electroconductive plates are provided in both sidewalls of said prismatic battery

case, and working openings are formed in said both sidewalls of said prismatic battery case so as to expose said electroconductive plates, and said electroconductive plates and selected one from said collectors and said plurality of connecting rods are bonded together by using one bonding method selected from resistance welding and soldering, said one bonding method being performed by supplying welding current between both of said electroconductive plates in a state of said electroconductive plates and said selected one from said collectors and said plurality of connecting rods being in contact with each other.---

REMARKS

By the above amendment, claims 4 and 11 have been amended and claims 19 and 20 have been added to delete multiple dependency. Claim 10 and the specification have been amended to correct errors.

If there should be any questions, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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MARKED-UP COPY OF SPECIFICATION AMENDMENTS

Paragraph beginning at page 1, line 18:

A conventional rechargeable battery module made by connecting a plurality of cells together, each having an individual cell case, has a problem that the connection path between the cells is long and the number of connection points is large and each of the connection points has small cross-sectional area [in the battery module is large], thereby increasing the component resistance leading to the increase of internal resistance thereof.

Paragraph beginning on page 8, line 13:

A prismatic battery module according to a fourth aspect of the invention includes a prismatic battery case constructed by connecting a plurality of prismatic cell cases together in series, each pair of cell cases sharing a separation wall; an electrode plate group formed by alternately stacking positive and negative electrode plates interposing a separator therebetween and further forming lead portions by projecting one side portion of the positive electrode plates and one side portion of the negative electrode plates in opposite directions, respectively; a plurality of connecting rods formed so as to penetrate the lead portions on both sides of the electrode plate group, respectively; and an electroconductive plate provided in at least one sidewall of the prismatic battery case and facing adjacent cell cases, in which each of the plurality of connecting rods and the electroconductive plate are connected to each other. As at least one of both end

portions of the plurality of connecting rods penetrating the lead portions of the electrode plate group connects the lead portions of adjacent electrode plate groups to each other via the electroconductive plate, the electrical communication path between the electrode plate groups becomes shorter allowing the reduction of the internal resistance of cell and further, the upper portion of the collector is not required to project upwardly from the electrode plate group, resulting in the volume reduction of prismatic battery case.

MARKED-UP COPY OF CLAIM AMENDMENTS

4. (Amended) The prismatic battery module according to claim 1 [any one of claims 1 and 2], wherein the adjacent collectors are connected to each other by using an electroconductive adhesive coated on opposing portions of said adjacent collectors, said opposing portions facing each other.

10. (Amended) A prismatic battery module comprising:
a prismatic battery case constructed by connecting a plurality of prismatic cell cases together in series, said plurality of cell cases being separated from one another by separation walls respectively;

an electrode plate group formed by alternately stacking positive and negative electrode plates interposing a separator therebetween and further forming lead portions by projecting one side portion of said positive electrode plates and one side portion of said negative electrode plates in opposite directions, respectively;

a plurality of connecting rods formed so as to penetrate said lead portions on both sides of said electrode plate group, respectively; and

an electroconductive plate provided in at least one sidewall of said prismatic battery case and facing adjacent cell cases,

each of said plurality of connecting rods and said electroconductive plate being connected to each other.

11. (Amended) The prismatic battery module according to claim 9 [any one of claims 9 and 10], wherein electroconductive plates are provided in both sidewalls of said prismatic battery case, and working openings are formed in said both sidewalls of said prismatic battery case so as to expose said electroconductive plates, and said electroconductive plates and selected one from said collectors and said plurality of connecting rods are bonded together by using one bonding method selected from resistance welding and soldering, said one bonding method being performed by supplying welding current between both of said electroconductive plates in a state of said electroconductive plates and said selected one from said collectors and said plurality of connecting rods being in contact with each other.